

THE FOLLOWING IS CLAIMED:

- 5 1) A method for evaluating a coating upon a metal surface comprising:
 forming a silica containing film or layer upon an electrically conductive
 surface,
 exposing the silica containing film or layer to a solution that interacts with the
 silica containing film or layer, and;
10 determining the effectiveness of the silica containing film or layer.
- 2) A method for testing the effectiveness of a silica containing coating or film
 comprising:
 providing a silica containing film or layer on a metallic surface,
15 contacting at least a portion of the silica containing layer with an acidic source
 wherein at least a portion of the metallic surface is dissolved by the acidic
 source,
 measuring the concentration of metal in the acidic source.
- 20 3) An analytical process comprising:
 exposing a silica containing film or layer overlying a metal surface to an
 acidic medium,
 detecting metal from the metal surface in the acidic medium, and;
 ascertaining the effectiveness of the silica containing film or layer based upon
25 the metal detected in the acidic medium.
- 4) The process of Claim 3 wherein the metal surface comprises at least one
 member selected from the group consisting of iron, steel, stainless steel, zinc,
 zinc alloys, aluminum, aluminum alloys, nickel and titanium.
- 30 5) The process of Claim 4 wherein the metal surface comprises zinc or zinc
 alloys.

- 6) The process of Claim 3 wherein the acidic solution comprises water and at least one acid selected from the group consisting of nitric, hydrochloric, sulfuric, phosphoric, hydrobromic and iodic.
- 5 7) The process of Claim 6 wherein the acid comprises nitric acid.
- 8) The process of Claim 6 wherein at least one coating overlies the silica containing coating or film.
- 10 9) The process of Claim 8 wherein the coating comprises at least one member selected from the group consisting of epoxies, silanes, latexes, urethanes, acrylics and polyesters.
- 10) The process of Claim 8 wherein the coating comprises at least one epoxy.
- 15 11) The process of Claim 1 wherein the solution comprises copper sulphate.
- 12) The process of Claim 3 wherein the metal surface is held within a testing apparatus that retains the metal surface in a predetermined location and permits fluid contact between the metal surface and the acidic medium.
- 20 13) The process of Claim 3 wherein the metal surface comprises a test fixture having at least one of the following features: threads, flat surface, openings and grooves.
- 25 14) The process of Claim 3 wherein said detecting comprises measuring the concentration of metal by using atomic absorption.
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